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Inference for multi-dimensional high frequency data

ABSTRACT. Employing estimation methods for the integrated covolatility matrix of a multi-dimensional continuous semimartingale from discrete high-frequency observations, we establish the asymptotic covariance matrix structure of the estimators and a consistent estimation of these asymptotic covariances, which allows to draw statistical inference and construct confidence intervals for multi-dimensional estimation problems. In particular, the theory enables us to perform risk management and portfolio optimization considering general portfolios in which the single assets are recorded as high-frequency data. Highlighting how to cope with a wide class of more complex functions of single assets, our focus is then the application to motivate and construct a certain conditional independence test for correlated assets.